AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (original) A method for real time determination of emulsion in a formation fluid comprising: (a) positioning an optical probe, having a probe surface which can measure changes in total internal light reflectance, such that the probe surface is in contact with a formation fluid, wherein the probe and its surface are composed of material which can withstand an extended period in contact with the formation fluid; (b) measuring the total internal light reflectance at the probe surface; and (c) determining in real time therefrom whether an emulsion is present or the degree of emulsification at such surface.

2. (original) The method of Claim 1 wherein the optical probe is an attenuated total reflectance probe.

3. (original) The method of Claim 2 wherein the attenuated total reflectance probe includes a photometer that measures light in a wavelength range of from about 400 to about 1500 nm.

4. (original) The method of Claim 3 wherein the photometer measures light in a wavelength range of from about 640 to about 680 nm.

5. (original) The method of Claim 1 wherein the formation fluid is in a pipeline or in a free water knock-out.

6. (original) A method for controlling emulsion formation in a formation fluid comprising: (1) placing an optical probe, having a probe surface which can measure changes in total internal light reflectance thereat, in contact with a formation fluid; (2) measuring the changes in total internal light reflectance at the probe surface; (3) determining in real time the presence of emulsion in the formation fluid as a function of the changes in total internal light reflectance; (4) comparing the determination of (3) to a predetermined maximum acceptable emulsion presence; and (5) effecting a change in the rate of addition, if any, to the formation fluid of an additive effective to reduce the emulsion presence; wherein: (a) the optical probe is composed of a material which can withstand an extended period of contact with the environment to which it is exposed; and (b) the rate of addition, if any, to the formation fluid of a demulsification additive

is: (i) increased when the emulsion presence is greater than the predetermined maximum acceptable emulsion presence; (ii) decreased or maintained when no emulsion is detected or when the emulsion presence is less than the predetermined maximum acceptable emulsion presence.

7. (original) The method of Claim 6 wherein the optical probe is an attenuated total reflectance probe.

8. (original) The method of Claim 7 wherein the optical probe is located in a pipeline or free water knock-out.

9. (original) The method of Claim 8 wherein two or more attenuated total reflectance probes are located in a free water knock-out.

10. (original) The method of Claim 7 wherein the attenuated total reflectance probe includes a photometer capable of measuring light in a wavelength range of from about 400 to about 1500 nm.

11. (original) The method of Claim 10 wherein the photometer is capable of measuring light in a wavelength range of from about 640 to about 680 nm.

12. (original) The method of Claim 6 wherein the demulsification additive is an alkyl phenol resin.

13. (original) A system for controlling emulsion formation in a formation fluid comprising a fluid flow path for flowing formation fluid recovered from a subsurface formation; an optical probe, having a probe surface which can measure changes in light reflectance at the probe surface, in contact with the formation fluid; a processor associated with the optical probe enabling collection of data therefrom, such data corresponding to the presence of emulsion or degree of emulsification in the formation fluid; and a controller associated with the processor enabling translation of data therefrom to initiate action to modify the presence of emulsion or degree of emulsification.

14. (original) The system of Claim 13 further comprising an automated probe surface cleaning device capable of extracting, cleaning, calibrating and inserting or reinserting the probe surface.

15. (currently amended) The system of Claim ~~13~~ 14 wherein the optical probe is an attenuated total reflectance probe.

16. (original) The system of Claim 13 wherein the fluid flow path further comprises a free water knock-out and the optical probe is located in the free water knock-out.

17. (original) The system of Claim 16 wherein at least three optical probes are located inside the free water knock-out having an oil outflow pipeline and a water outflow pipeline, at positions such that a first probe is at or adjacent to the level of the oil outflow pipeline, a second probe is at or adjacent to the level of the water outflow pipeline, and a third probe is between the oil outflow pipeline and the water outflow pipeline.

18. (original) The system of Claim 13 wherein the optical probe is an attenuated total reflectance probe.

19. (original) The system of Claim 17 wherein the optical probes are attenuated total reflectance probes.

20. (original) The system of Claim 12 wherein the processor and controller incorporated into a single unit.